Mid-Flight Electro-Magnetic Beam Diffraction Property Modification for 'Anonymized' Points of Emission of Jamming for Protecting Ground and Air-Based Jamming Emitters

28 October 2022
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Introduction

Conventional RADAR jamming is effective only so long as emitters cannot be located and destroyed. Operating a jamming platform in a combat situation is one of the riskiest tasks personnel can carry out as the emission of a jamming signal is an invitation to attack that advertises one's own position as a natural consequence of the signal emission.

Abstract

What if there were a mechanism for emitting disruptive signals from a combination of ground or air-based platforms in such a way that the apparent source of the transmission would be a patch of empty sky and the true sources of jamming would be multiple emitters all sending a focused beam toward that single point of convergence?

Such an effect may be realized by emitting a RADAR beam with extreme focus and as little leakage of signal as possible with a single frequency and polarity. For the sake of this example, we'll give the initial beam a vertical polarity.

Flying dozens or hundreds of miles away, an aircraft emits a similarly powerful, focused radar beam and aims it at a patch of sky that creates a point of convergence for both beams. Importantly, this second beam has a horizontal polarity and consists of a variety of frequencies in which the frequency is a direct match for Beam A only in the exact center but shifts gradually higher approaching the edges of the 'convergence zone.' The effect of this interaction is that Beam B will distort Beam A's uniform frequency while preserving its unipolar property. The embedding of multiple frequencies of energy on the same axis of polarity would therefore cause the diffractive index of both beams to soar. Ordinarily, having a beam with a high diffraction index is undesired for nearly all applications, but in this case, a deliberately exaggerated diffractive index initiated in mid-flight helps to create the illusion of a jamming emitter in a false location. Also importantly, the beam diffraction in this case is being influenced by self-interaction of EM moving in a given direction. Usually when one talks about diffraction, they are talking about the crispness of focus of a beam of light at the moment it is emitted. In this case, however, EM is reconfigured in mid-flight to render it more likely to self-diffract relative to its property of diffraction at the time of emission. The presence of multiple frequencies on the same axis of polarity is substantially conducive to self-diffraction due to its tendency to increase phase height relative to wavelength. The greater this value, the more readily electromagnetism of all sorts will divert its focus. It should also be noted that embedding focused beams within soliton waves (to deliver focused energy at extreme ranges of 200 miles or more,) another of my previously proposed

systems, would be an example of the opposite of the effect we are trying to accomplish in this case.

Conclusion

From the perspective of enemy ELINT aircraft, the point of convergence of the two beams would appear to be a jamming source and would become a priority target. When attack aircraft are sent in to neutralize the phantom jamming source, they would themselves become targets as they must venture within range of friendly RADARs. Friendly jamming sources would thus be made highly survivable, greatly enhancing the ability to withstand a provocative attack. The same strategy could be used in support of offensive gambits, providing a means of jamming enemy electronics without betraying the position of friendly assets.